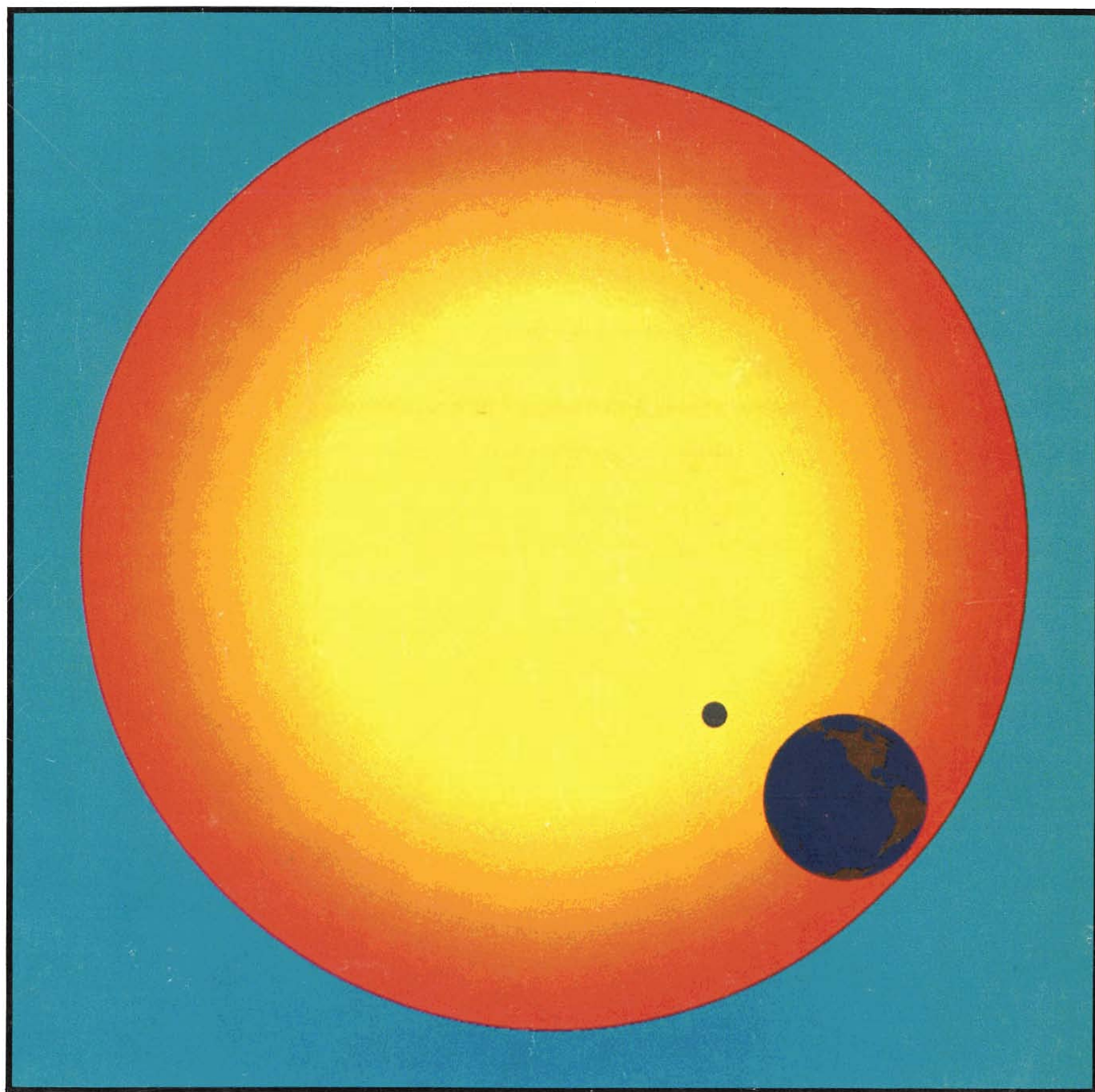
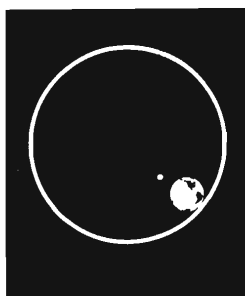


Los Alamos Science

LOS ALAMOS NATIONAL LABORATORY





On the cover: Artist's conception of the sun, earth, and moon before a solar eclipse. This computer-graphic illustration was created using a color-mixing subroutine developed by Rongriego. The subroutine compensates for the nonlinear response characteristics of an FR80 micro-film recorder to provide a perceptibly linear intensity gradation. Saturation problems are eliminated and the additive colors, red, green, and blue may be mixed uniformly to produce a full spectrum of color and intensity.

Overstriking concentric circles of full-intensity red and green delineates the sun's yellow center; the outer regions of the sun were created by selectively removing green with a cosine distribution. Selective blanking protected the emulsion where the earth and moon were to be exposed on the film. These images, generated in separate files, were then projected into the protected areas. The resultant slide was produced using MAPPER, a graphics software package developed at Los Alamos.

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Inside this Issue

"The endeavor is not, as is sometimes thought, a way of building a solid, indestructible body of immutable truth, fact laid precisely upon fact in the manner of twigs in an ant hill. Science is not like this at all: it keeps changing, shifting, revising, discovering that it was wrong and then heaving itself explosively apart to redesign everything. It is a living thing, a celebration of human fallibility. At its very best, it is rather like an embryo."

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Science, a celebration of human fallibility—how refreshing is this phrase in an age when scientists are asked for sure answers and dare not admit the virtue of their uncertainty. But uncertainty is surely a theme of science, and a theme of this issue as well. From nonlinear studies, which are just in their infancy, to the age-old search for fundamental building blocks of nature, from exploring the solar corona to unfolding its influence on the earth's atmosphere, scientists struggle to enlarge the fragile tissue of interconnected ideas. We are gratified to see these efforts encouraged at a time when pragmatic concerns weigh so heavily.

One embryo in this struggle will develop at the Los Alamos Center for Nonlinear Studies. The Center will coordinate research on erratic and complex phenomena that appear in different forms in almost all areas of science and present major stumbling blocks to the success of advanced energy technologies. One of the Center's first projects may be to explore these phenomena as they relate to detonation of high explosives, a topic of continuing study at this Laboratory but, as described in this issue, still more of an art than a science. Another embryo will be fostered by the

Los Alamos branch of the Institute of Geophysics and Planetary Physics; here scientists from University of California and Los Alamos National Laboratory can form new collaborations on problems in solar-terrestrial physics.

These efforts can flourish only in a supportive environment created by strong leaders who know the nature of the endeavor and all of its risks. Peter Carruthers, former Theoretical Division Leader and currently Senior Fellow of the Laboratory, discusses the subtle role of leadership in science in an unusual and personally revealing interview.

Finally, we focus on neutrino experiments that may reshape our understanding of the universe and the fundamental forces within it.

Altogether, this second issue of *Los Alamos Science* is in itself a celebration, a celebration of the continuing human endeavor we call science.



Lewis Thomas, "On the Uncertainty of Science," Harvard Magazine September-October 1980. Reprinted with permission. Lewis Thomas, author of The Lives of a Cell and The Medusa and the Snail, is now chancellor of the Memorial Sloan-Kettering Cancer Center in New York.